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UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE RO

REPLY TO: 3420 DATE: DEC 17 1986

SUBJECT: Evaluation of Six Progeny Test Sites on the Shasta-Trinity National Forest (Report No. 86-23)

TO: Forest Supervisor, Shasta-Trinity National Forests

Six Regional tree improvement progeny test sites on the Shasta-Trinity National Forests were examined for insect and disease problems. Diseases noted were black stain at Kinyon; western dwarf mistletoe at Bottom , Harrison Gulch, Copper Hill, and Red Hill; annosus root disease at Bear Mountain and Copper Hill; Douglas-fir dwarf mistletoe at Copper Hill, and Elytroderma needle disease at Bear Mountain. Pocket gopher activity was very evident at Bear Mountain and Kinyon. No insect activity was noted. Management alternatives are presented in the enclosed evaluation to deal with major pests on each site.

INTRODUCTION

In the summer, 1986, James Allison visited six locations on the Shasta-Trinity National Forest either proposed for possible use as progeny test sites or now being used as progeny test sites by the Tree Improvement Program. The sites are shown in the following table:

Test Site	Proposed	Existing	Location	Species Now Planted	Species To Be Planted
Bear Mountain	X		McCloud RD		PP*
Kinyon	X		McCloud RD		PP
Harrison Gulch	X		Yolla Bolla RD		PP
Bottom	X		Big Bar RD		DF,PP
Copper Hill	X		Hayfork RD		DF,PP
Red Hill		X	Mt Shasta RD	DF	DF

*PP = Ponderosa Pine DF = Douglas-fir

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The objective of the examination was to determine the presence of, or potential for, pest problems which could adversely affect the objectives of the Regional Tree Improvement Program. Observations and discussion of the six sites follow.

OBSERVATIONS AND DISCUSSION

Bear Mountain

The proposed Bear Mountain Progeny Test site (T.40N. R2E. Sec. 13) is located in a mixed conifer stand. It was logged in 1985. The stumps had been removed and piled in wind rows to be burned. The site was also plowed and disked. The adjacent stand is composed of ponderosa pine, white fir, incense-cedar and Douglas-fir. This site is to be planted with ponderosa pine in 1987. Fomes annosus conks were found in both ponderosa pine and white fir stumps. Some of the ponderosa pine on the margin of the stand were infected by Elytroderma deformans, a needle and twig blight. Pocket gopher mounds were evident throughout the adjacent area.

Fomes annosus, the causal agent of annosus root disease, once established in a stump or tree, can remain alive for 50 years or more. Young conifers established within infection centers often die shortly after their roots contact infected roots in the soil. The removal of the stumps and the double-disking that will occur on the site will greatly reduce the length of time when Fomes annosus will remain viable on this site and the chances of the seedlings becoming infected. The amount of Elytroderma needle blight observed was high enough to be a factor of concern for the survival and health of the ponderosa pine seedlings. The following actions can be taken within a 100 ft. buffer around the planting site: 1) remove heavily infected trees; and 2) prune all Elytroderma brooms and infections out of lightly infected trees. This will greatly reduce the inoculum to which the test planting is exposed. Secondly, we recommend an annual inspection of the planting in the late spring for Elytroderma infections. All such infections should be pruned out of the test trees. In addition, the marginal surrounding stand should be inspected occassionally (every 5 years or so) to see if the disease is building up in these trees. If so another control action would be adviseable. Without pocket gopher controls, planting on this site may be unsuccessful. Reducing or preventing gopher damage can be accomplished by 1) direct reduction in numbers by trapping; 2) preventing population increased by controlling grasses and forbs; 3) the use of physical barriers such as "Vexar" tubing around the shoots and roots of seedlings; or 4) combination of these methods.

Kinyon

The Kinyon progeny test site (T 40N, R 1W, Sec. 24) has been logged, the stumps removed and the site disked. Pocket gophers are present on the site. Black stain was found in a group of ten ponderosa pine adjacent to cleared site. Six to eight of the trees are dead with the other trees in various stages of decline. The site is scheduled to be planted in the spring of 1987.

Black stain root disease must be considered during and after establishment of the progeny test site at Kinyon. The fungus that causes black stain spreads locally between trees through rootlet contact or fungus growth through the soil for short distance and direct infection of small feeder roots. Disease centers are probably initiated by root-feeding insects carrying spores from an infected tree to an uninfected tree. The fungus has three host-specific strains that infect either ponderosa and Jeffrey pines, singleleaf pinyon pine, or Douglas-fir. In most situations, the fungus does not cross-over between species, even in mixed stands. The fungus rarely spreads or survives in roots after the tree dies even though it spreads through root systems of living trees. The fungus persists for only a few years in wood of dead trees. Black stain now infecting a group of ponderosa pine adjacent to the test site should not be a problem because of the stump removal and double-disking should have removed most of the host material and eliminated the fungus. The longer the site remains fallow after clear-cutting and double-disking, before ponderosa pine are planted, the less the risk that the planted seedlings will become infected. The creation of a 75 foot buffer strip around the margin of the test site by removal of all ponderosa pine would prevent local spread via root contact from infected pines outside the site. Pocket gopher activity will have to be curtailed or planting in this area may be unsuccessful. Reducing or preventing gopher damage can be accomplished by 1) direct reduction in numbers by trapping; 2) preventing population increased by controlling grass and forbs, (3) the use of physical barriers such as "Vexar" tubing around shoots and roots of seedlings; and (4) combinations of these 3 methods.

Bottom

The Bottom progeny test site (T 4N, R 7E, Sec 24 and 25) is located in a mixed conifer stand. The site has been clearcut, the stumps removed, and the site disked. The stumps have been piled in wind rows and will be burned this fall (1986). Western dwarf mistletoe is present on ponderosa pine across the road from the progeny site. This site, which is to be planted with ponderosa pine and Douglas-fir, will be disked again in the fall of 1987 and planted in the spring of 1988. There are two alternatives available for protecting the progeny test site from dwarf mistletoe depending on

how long the site is to be used. If the site will be used for only a short period, 25 years or less, one can reduce the chances of infection in this short period by removing all infected ponderosa pine in a 100 ft. wide buffer strip around the progeny test site. If the progeny test site is to be used over a longer period one can remove all the ponderosa pine (infected and noninfected) in a 100 ft buffer around the progeny test site. This second, more drastic, alternative will prevent the mistletoe from gradually invading the buffer and eventually infesting the progeny test planting. All stumps created, when removing dwarf mistletoe infected trees in a buffer, should be treated with borax.

Copper Hill

The Copper Hill progeny test site (T 1N, R 7E, Sec. 26) is located in a mixed conifer stand. The site is scheduled for logging in early fall 1986. This will be followed by stump removal and disking of the site. The stumps will be piled in windrows and burned. The site will be disked again in 1987 and planted to ponderosa pine and Douglas-fir in 1988. Diseases present include: western dwarf mistletoe (A. campylopodium); Douglas-fir dwarf mistletoe (A. douglasii); and annosus root disease (Fomes annosus). Two alternatives are available for protecting this progeny test site from dwarf mistletoe depending on how long the site is to be used (See Bottom site). The removal of the stumps and the double-disking will greatly reduce the chances of seedlings being infected by Fomes annosus. All stumps created adjacent to the test site, where dwarf mistletoe infected trees were removed, should be treated with borax.

Red Hill

The approximately 21 acre site (T40 N, R5W, Sec. 25) is located within a stand composed of ponderosa pine, Douglas-fir, incense-cedar, and black oak. The fenced and locked site was planted with Douglas-fir in the spring of 1985. There is a two acre island of Douglas-fir, incense-cedar, and ponderosa pine saplings, poles, and small sawtimber between the planted acreage and the future site which has been cleared, piled, and burned. The future site will also be planted with Douglas-fir. Trees (Douglas-fir, ponderosa pine and white fir have been planted outside of the fence in a cleared area about 100 feet from fence. The planted Douglas-fir looked very vigorous and healthy with no insect or disease problems. The only disease present was western dwarf mistletoe (A. campylopodum) on ponderosa pine on the island between sites and in the adjacent stand. Since western dwarf mistletoe does not infect Douglas-fir, it does not present a threat to the progeny test planting.

Harrison Gulch

The Harrison Gulch progeny test site (T 29N, R 10W, Sec. 15) is located in a mixed conifer stand. The black oak has been cut for firewood. The rest of the trees on this site will be logged in the fall of 1986. Stumps will be removed and the site plowed and disked. The site will be disked again in 1987 and planted to ponderosa pine in 1988. Western dwarf mistletoe (A. campylopodum) was common on ponderosa pine in the stand. For alternative available for protecting the progeny test site from dwarf mistletoe see alternatives under Bottom site.

for JOHN L. NEISESS
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State and Private Forestry